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Serigraphy



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Tusche Stencil

Fritz Koenigsmann 1966

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INTRODUCTION

Silk screen printing is the youngest of the graphic arts printing media. It is a development from the ordinary stencil in which colours are applied through holes cut in a piece of paper (or other material) to form a pattern on the flat surface beneath. In the early history of the Fiji Islands, stencils made by cutting perforations in banana leaves were used to apply patterns to bark cloth with vegetable dyes.

The ordinary stencil must have ties or bridges worked into the design to keep the parts of the stencil together. Japanese craftsmen centuries ago cut incredibly fine and detailed stencils from specially treated paper which were used to print textiles. They developed a method of keeping the parts of the stencils together by ties of silk or human hair glued to the paper. These ties were so fine that they did not show in the print. These stencils can sometimes be found in museums. The silk strands usually form a network all over the stencil holding all the parts in the right place, and are similar in purpose to our modern silk screen.

The idea of using a silk fabric stretched on a frame as a screen or ground to hold a tieless stencil is credited to Samuel Simon of Manchester,

who was granted a silk screen process patent in England in 1907. Methods and techniques have been further developed by many craftsmen and artists since then.

The process was at first used in commercial work for signs and posters, then in industry for decorating furniture, etc. It is much used in the textile industry for printing patterns on cloth. Many glass and plastic containers have designs or lettering applied by silk screen. It is economical for runs of a dozen up to a few hundred.

In 1938 a group of artists in New York began to experiment with the silk screen as a medium for creating original works of art. They produced original prints which made their way into exhibitions and museums. The new art was given a new name — serigraphy (seri — meaning silk). The words serigraphy and serigraph are reserved for the fine arts aspect of silk screen printing and were invented to set it apart from the commercial connotation of the original name. This is not so necessary now that the medium has been widely accepted as one of the graphic arts worthy of the attention of printmakers.

EQUIPMENT AND MATERIALS

MAKING A SCREEN

Frames can be bought ready-made, but it is simple and much cheaper to make your own.

The frame must be sturdy and rigid enough not to warp or twist when the silk is tightly stretched on it. The corners may be fastened together by any of the standard carpenters' methods; one of the simple methods will be described in detail here. A good size of frame to start with would have a printing surface of $15\frac{1}{2}" \times 18\frac{1}{2}"$. This is about the smallest size that is adaptable to a variety of projects. A good grade of 2x2 pine is suitable. The frame needs an extra 3" at each end and 2" at each side in addition to the printing area to act as a paint reservoir. Since the actual measurement of 2x2 wood is $1\frac{3}{4}" \times 1\frac{3}{4}"$ the dimensions will be as shown in Figure 1. Note that the frame will require two pieces of wood 23" long and two pieces $24\frac{1}{2}"$ long. The corners should be glued, nailed and reinforced with corner plates as shown in Figure 2. Use white glue (made for gluing wood, etc.) and 3" nails. The corner plates and screws for fastening them on are bought at hardware stores, they must be fastened on with screws.

For most uses the frame needs to be hinged to a

baseboard. This should be $\frac{3}{4}"$ plywood, the upper surface smooth and flat. (Most plywood will need to be sandpapered.) The base should be 1" to 2" larger than the frame on three sides; 2" larger at least on the hinge side. So for one $16\frac{1}{2}" \times 18\frac{1}{2}"$ printing frame, the base should be about $28" \times 32"$.

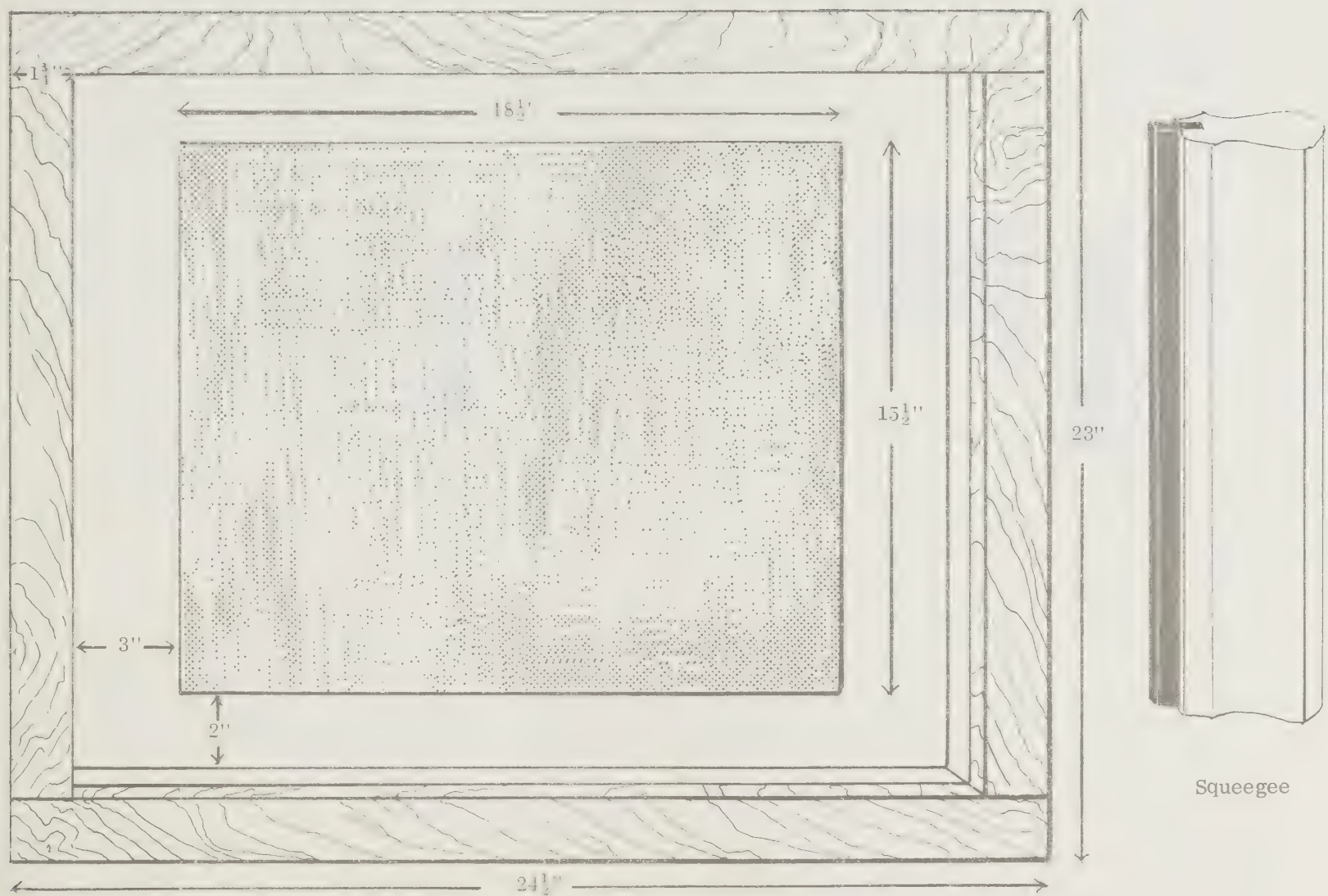
The frame is fastened to the baseboard by two 2" or $2\frac{1}{2}"$ loose pin butt hinges. These are screwed to one of the long sides and to the baseboard about 3" in from the edge. The frame can be $\frac{1}{16}"$ above the baseboard after the hinges are on.

This completes the frame and its mounting. Now take the pins out of the loose pin hinges in order to fasten the silk to the frame.

● Silk

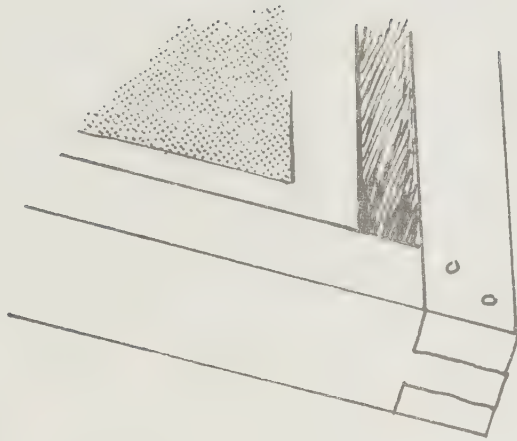
Real silk is the only satisfactory material to use for the screen. It must be of good quality to give satisfactory results. For many years the best silk for the purpose, called "silk bolting cloth", came from Switzerland. Now an equally good silk, usually less expensive, is imported from Japan. The silk is classified according to the mesh, from 0000 (very coarse) to 25 (very fine). X, XX or XXX often follows the number; this refers to the thickness of

Figure 1

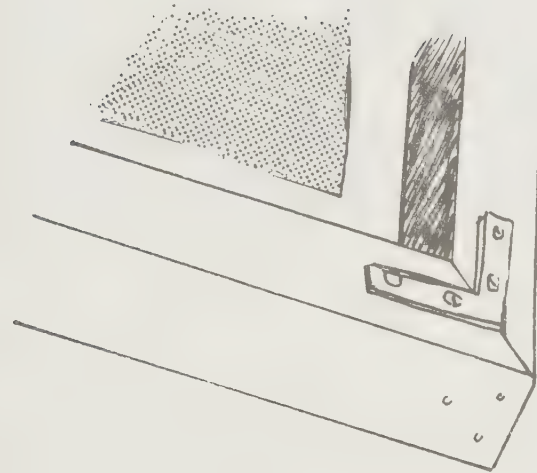


The frame and its mounting

Figure 2



Tongue and groove joint



Mitred joint with reinforced corner plate

the threads: X is the finest, XX medium and XXX the thickest. A standard mesh for average work is 86 threads per inch. A finer mesh may be wanted for especially sharp, fine work. The silk may be bought from any supplier of silk screen processing supplies. (Look in the yellow pages of the phone book under Silk Screen Process Supplies, or Screen Process Supplies, or Process Printing Supplies.)

It is possible to use cotton organdy, which is cheaper, but the difficulties encountered in its use are not worth the difference in cost. The cotton will stretch when it is wet and become baggy with use, making it impossible to get a sharp print or to register colours properly. It will not last as long as silk under the constant wear of the squeegee.

● Stretching the Silk

The silk should be slightly larger than the outside dimensions of the frame for easy handling when stretching it on the frame. (Some people prefer to work with silk the same size as the frame; this is purely a matter of individual preference.) The silk must be stretched taut and even, and as tight as possible. The best and quickest way to fasten

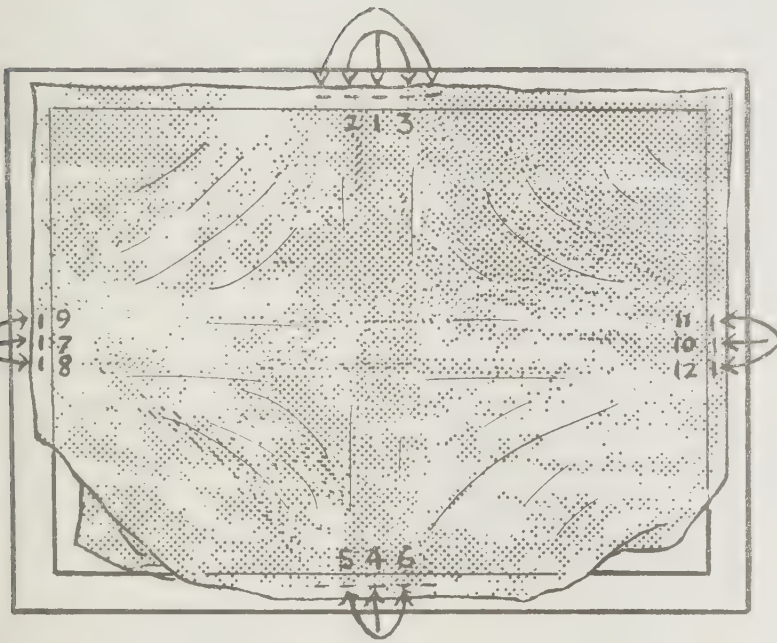
it on to the frame is by using a staple gun. If tacks are used, they should be staggered to hold the cloth firmly. The warp and weft threads of the fabric should be parallel to the edges of the frame. See Figure 3 for the order of fastening. Start in the middle of one of the sides, go to the middle of the side opposite, then the middles of the other two sides. Continue on alternate sides of the first staple or tack, then the second, then the third and fourth. Work evenly towards the corners, keeping the silk straight and taut all the time. When the silk is well fastened all around the frame, trim it $\frac{1}{4}$ " or $\frac{1}{2}$ " in from the outside edges of the frame.

● Taping

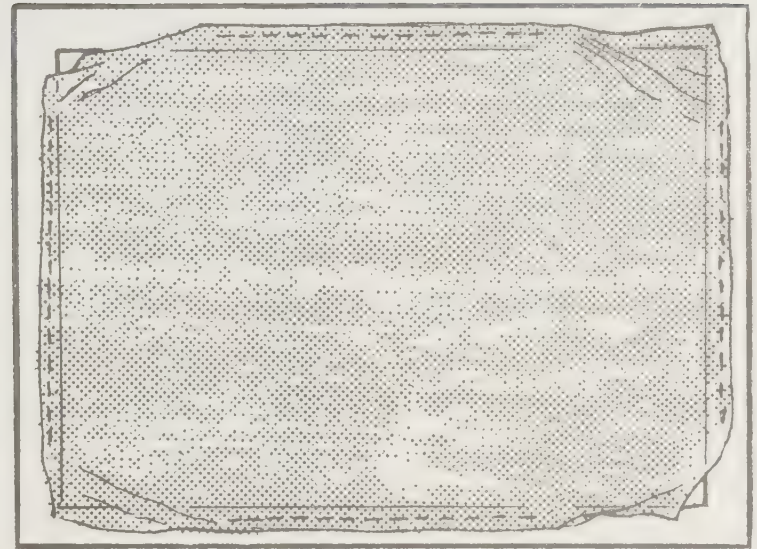
Use heavy 2" wide gummed brown kraft paper tape. It is used to seal the edges of the silk to the wooden frame and it provides an area which serves as an ink reservoir while printing. All corners must be sealed; this makes the screen easier to clean and prevents the silk from rotting where it meets the wood. The tape is also important in keeping the silk taut. See Figure 4 for the procedure to be followed in taping the screen. We have allowed 2" extra at each side and 3" extra at each end of the screen we are planning; this area is to be

Figure 3

Stapling Silk to Frame



Order in which staples are placed when stretching silk beginning 1, 2, 3, and 4, 5, 6, etc.



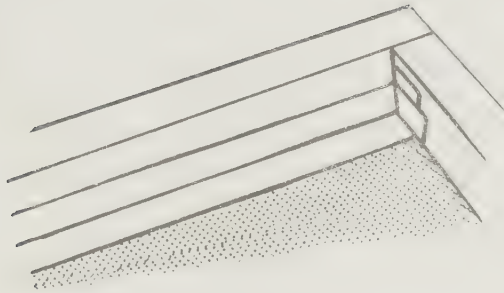
Continuing to stretch and staple

Figure 4



Tape in place on upper side of screen to form the ink reservoir

Figure 5



First gummed strip positioned partly on wood to seal edge and corner

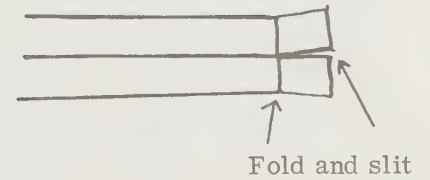
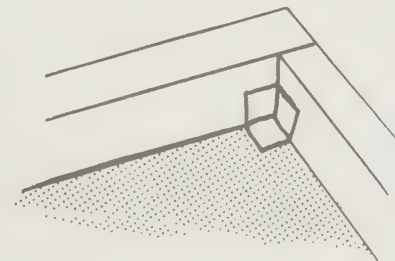
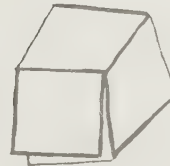
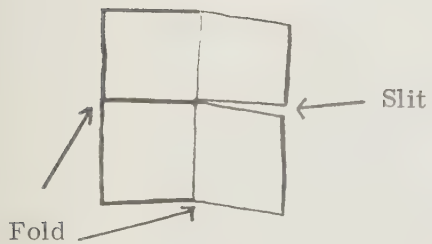


Figure 6



Square of gummed tape folded to make corner reinforcement before other strips put in place

covered on both sides with tape to form the ink reservoir.

Starting on the upper side of the screen, take a piece of tape for each of the four sides that will just stretch the length of the side, fold it lengthwise down the middle, gummed side out, wet the gum, and apply it to the corner where wood meets silk, half on the wood and half on the silk. See Figure 5. Use extra pieces to seal the corners as shown in Figure 6. Add enough strips to cover the widths designated as the ink reservoir, (Figure 4). Now turn the frame over to tape the under side. Put tape over the staples or tacks, cover the edge of the silk and be sure the tape extends over and is well stuck to the wood, and add enough strips to cover the area that was covered on the upper side of the screen, (Figure 7). Leave to dry thoroughly before shellacking.

● Shellacking

Use orange shellac of the standard strength as bought in hardware or paint stores. Brush a thin, even coat of shellac over all of the frame, the brown paper tape (both sides) and about $\frac{1}{4}$ " of the silk where it meets the brown paper take on all four sides, (Figure 8). Be sure all cracks are

sealed. Shellac the baseboard too. Repeat with a second coat of shellac when the first is dry.

● Frame Support — The Drop Leg

It is necessary to have some means of holding the frame up from the baseboard while not actually printing. This can be done by simply putting something such as an empty tin can under one edge, (Figure 9). A better way is to attach a drop leg loosely fastened by a screw to one side of the screen so that it will swing down to support the screen when it is lifted, (Figure 10).

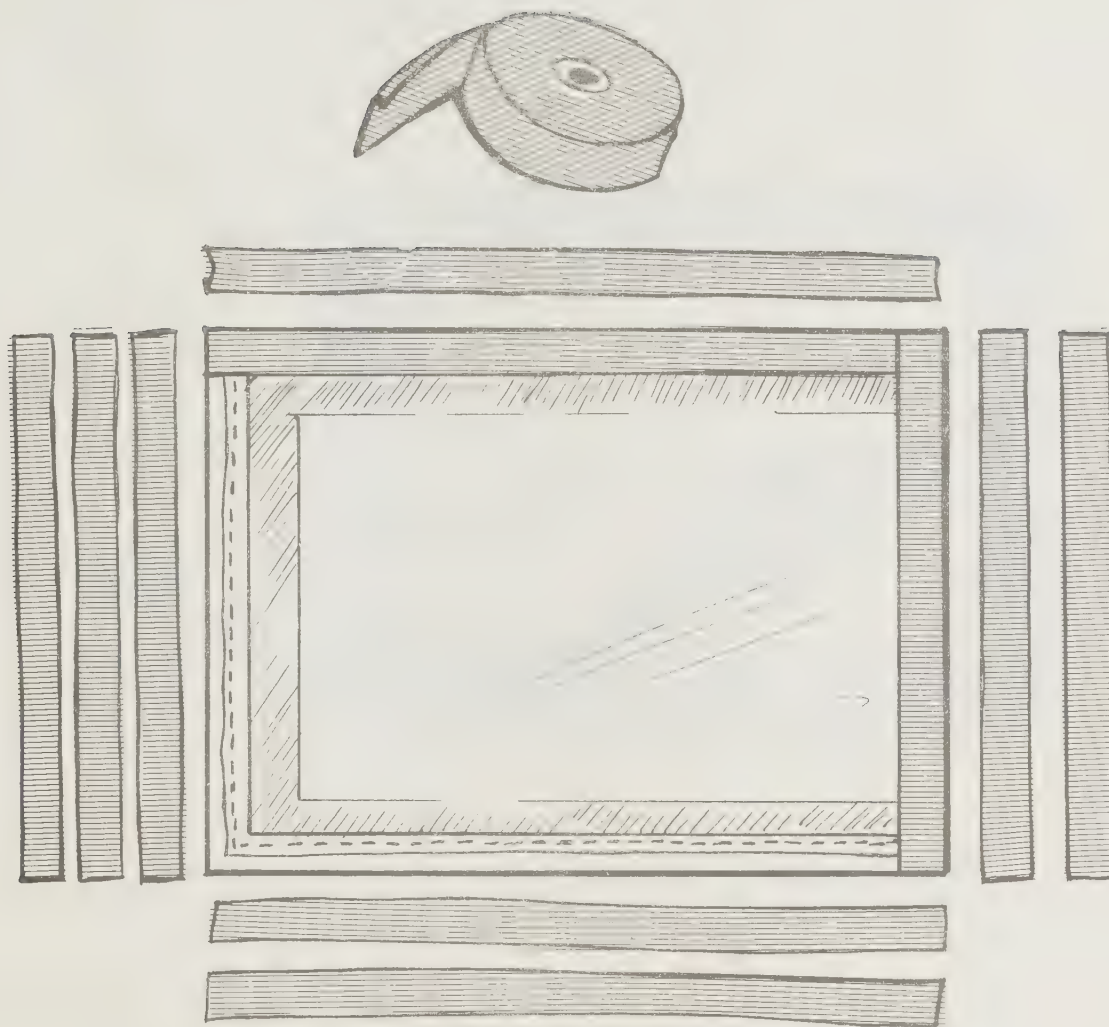
Re-assemble the screen and baseboard by putting the pins back in the hinges.

The screen is now ready for a stencil.

● The Squeegee

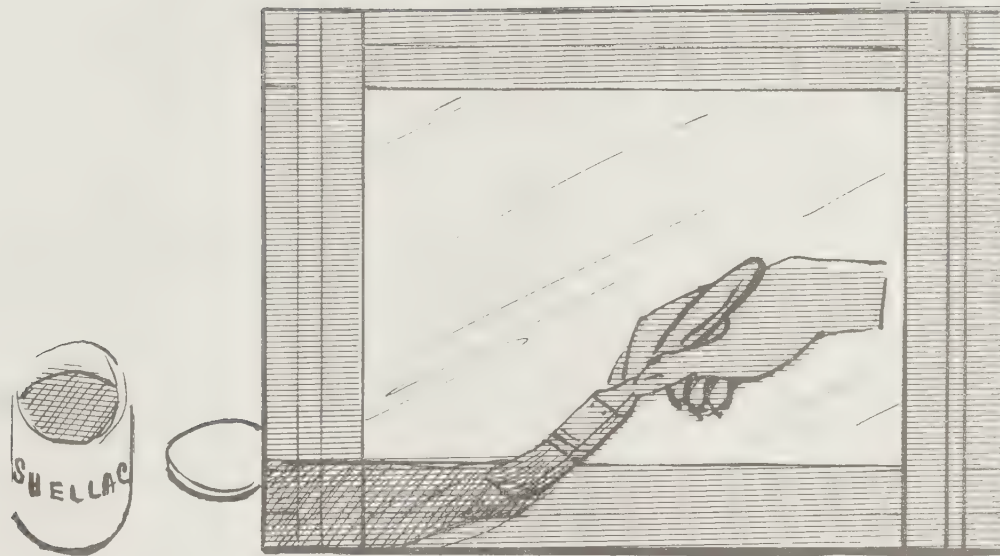
The squeegee is used to force the ink through the open parts of the screen on to the paper. It consists of a rubber blade mounted in a wooden handle. Squeegees can be bought ready-made, or they may be put together from easily available parts. (This is cheaper.) The rubber strip should be a piece

Figure 7



Gummed tape (brown paper) strips to be stretched over stapled silk

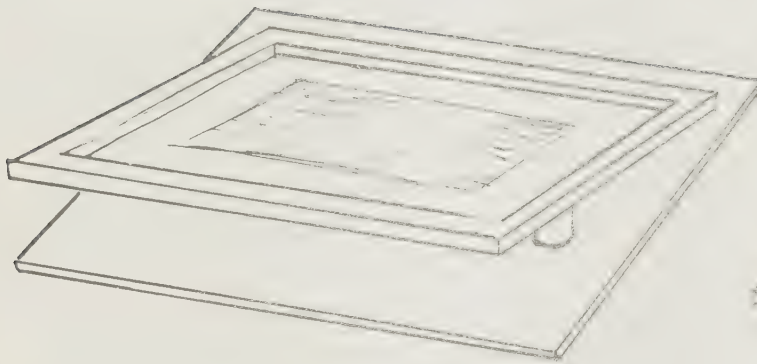
Figure 8



Tape in place on lower side of screen and shellac being applied

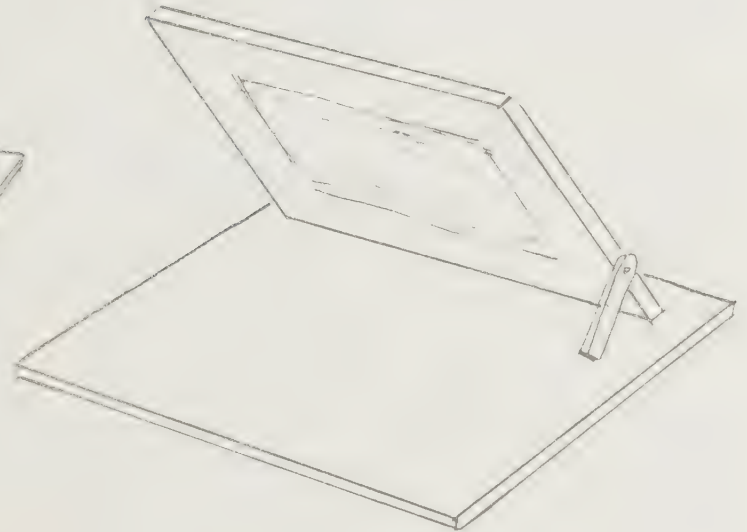
Methods of Frame Support

Figure 9



Empty tin can under edge

Figure 10



A drop leg fastened by a screw

of the material especially supplied for screen printing, since this is one of the most critical pieces of equipment for the process. The rubber may be bought in hard, medium or soft grades from screen process suppliers. These will produce different effects. It is best to start with the medium hard rubber for general work. A softer squeegee is used for textile printing, to get a heavier deposit of ink, or for printing on uneven surfaces. A harder squeegee is used to produce a thinner ink film or sharper prints.

The wooden handle can be bought from the same sources as the rubber. The commonest shape is shown at (a) in Figure 11. It is bought by length (as is the rubber). It must extend beyond the width of the open area of the silk, but fit easily into the frame. For our suggested $15\frac{1}{2}" \times 18\frac{1}{2}"$ screen, an 18" squeegee would be the best. The rubber and the wood should be the same length.

To save money, the wooden handle can be made. Shape (b) is easy to make if power tools are available; if not, shape (c) can be made by nailing and gluing together three strips of the sizes shown. Remember, though, that the good grip provided by shape (a) is helpful.

To mount the rubber in the wooden handle, place

the rubber in the groove, making sure it touches the bottom of the groove all the way along, and fasten it there by a few small nails. The nails should be slim finishing or common nails long enough to go through wood and rubber and well into the wood on the other side (but not long enough to come through the other side). They should be about 1" apart, with a couple of extra ones at each end set $\frac{1}{4}"$ and $\frac{1}{2}"$ from the ends, (Figure 11). Remember you will want to take them out to reverse or change the rubber; so do not hammer them in beyond the surface of the wood.

It is important that the edges of the squeegee blade be sharp, smooth and even. Irregularities in the edge will produce irregularities in the printing; for example, a nick in the blade will cause a dark streak in the print. When the corners of the blade become slightly rounded from use, the print may lack sharpness. The rubber then must be sharpened. This is done by placing a sheet of medium sandpaper (garnet paper is best) on a table and rubbing the squeegee back and forth over it until the corners are sharp again. (Figure 12). It may be found helpful to tack the sandpaper down to a table or board to keep it from slipping. Note that the squeegee must be kept upright during this operation so that the corners will be square.

Figure 11

Three Types of Squeegees

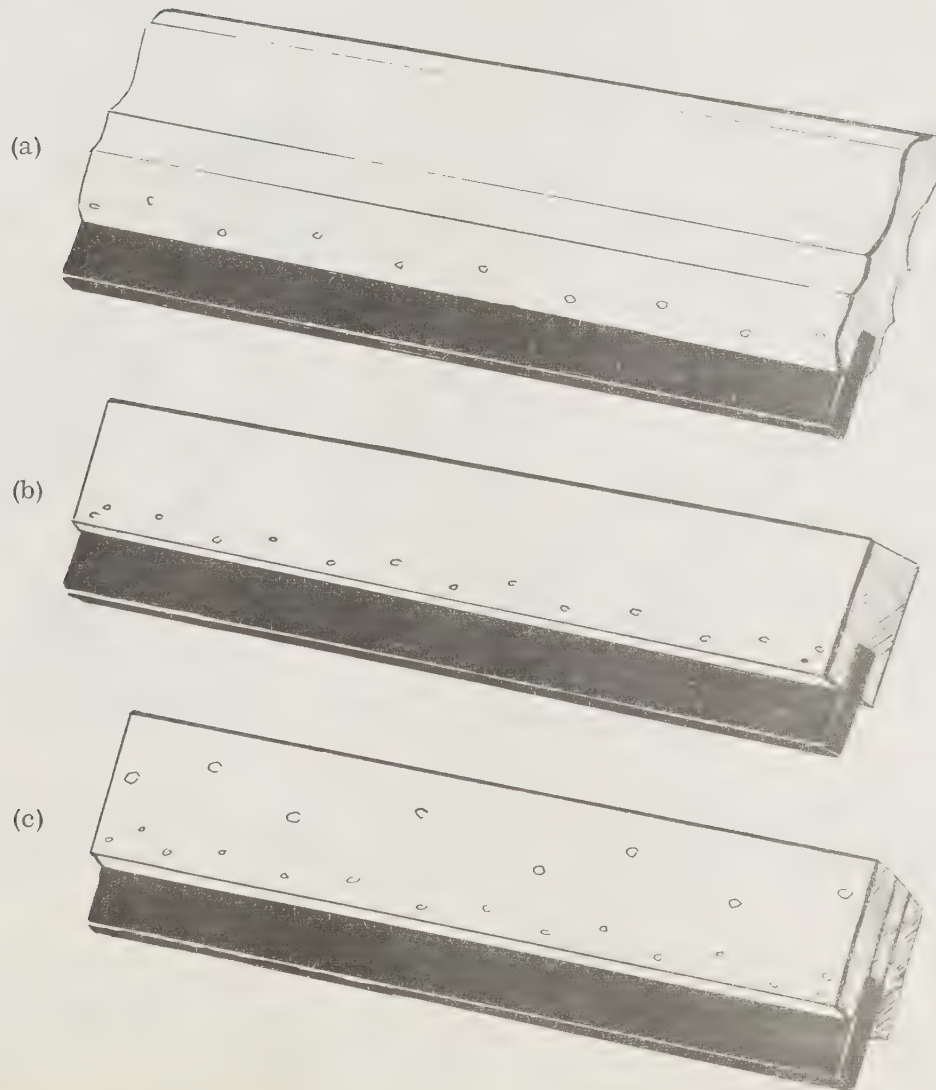
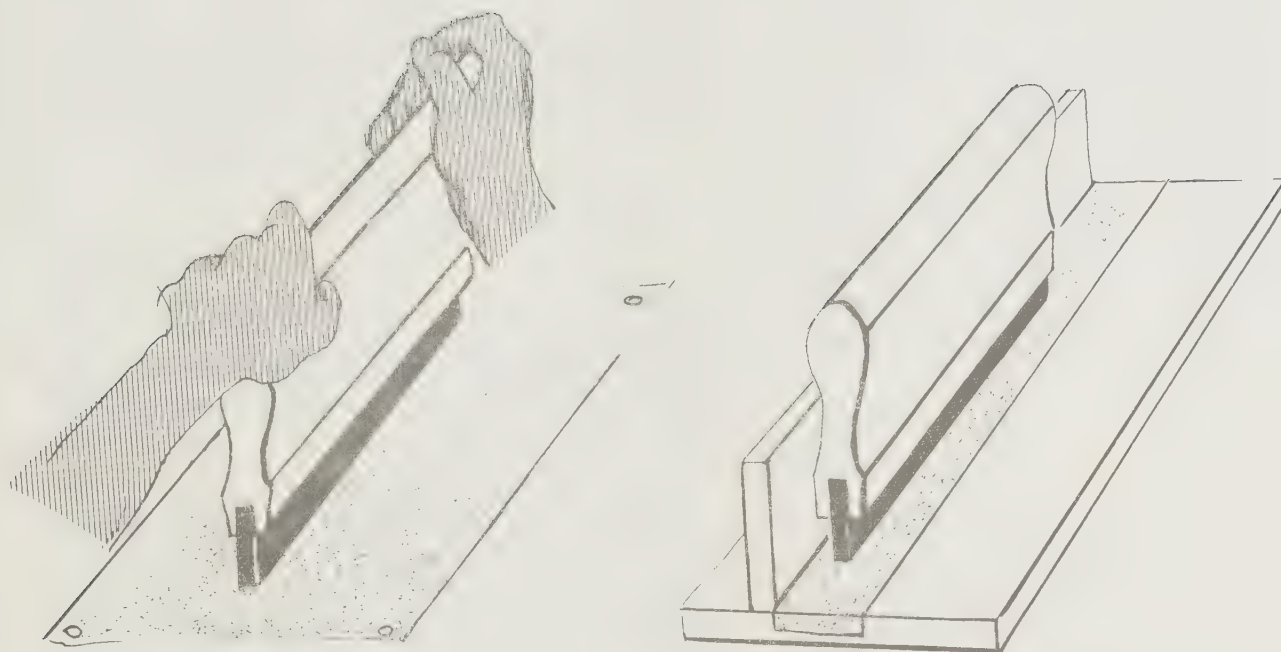


Figure 12



Sharpening the squeegee

Instead of sanding, a strip can be cut off the edge using a metal straight edge and a very sharp knife. (Wet the knife blade when cutting rubber.) This operation requires care and skill to produce a sharp, even edge.

If the other two corners of the rubber (the ones in the handle) are still sharp and smooth, the rubber may be reversed in the holder and the new edges used for printing.

● Inks

In commercial silk screen process printing many inks (or paints; the words are used interchangeably in this work) are used, depending on the materials being printed upon and the conditions in which they will be used.

For printing on paper, screen process colours can be bought from the supply houses. These are ready-mixed colours, in wide ranges of both opaque and transparent colours which can be intermixed. To mix transparent colours we can use transparent base (sometimes called extender or economy base), also bought from the supply house, adding artists' oil colours (in tubes) to colour it. Very little of the colour is needed. The pigments in the artists'

oil colours are of usually a better grade than those in the process colours; therefore the inks mixed from the artist's colours are purer, brighter and more subtle colours. This base can be used to make opaque colours as well. More colour is needed for opaque colours. All the types of ink mentioned can be intermixed. It is very useful to have a box of tongue depressors (from the drug store) and paper cups for mixing inks. Do not use plastic cups for mixing these process colours — the solvent in the paint will dissolve them. This can produce a spectacular mess when they are left overnight! Empty tin cans are also useful for mixing paint. Covered jars are needed if paint is to be stored for more than a couple of days. Aluminium foil can be used as a temporary cover.

● Solvents

To thin the process colours use mineral spirits or varsol, or in a pinch, kerosene. Any of these can be used in cleaning the paint out of the screen: varsol is the one used most commonly.

Lacquer thinner (or lacquer thinners—several solvents combined and sold together in one can) is a more effective but more expensive solvent for

the process colour. It is used in the final cleaning of the screen. It is also used in working with the film stencil.

All these solvents can be obtained at hardware and paint stores, the varsol also at gas stations.

● Paper

Almost any type of paper can be used, depending on the results desired. Coloured paper can produce interesting results.

The paper should be at least one inch, preferably more, larger all around than the area being printed. Printing to the edge (for cards, etc.) is possible, but difficult.

Paper can be bought from many sources — art stores, stationery stores, printers (very good for large sizes), school suppliers, etc.

● Glue (for glue stencils)

Old-fashioned brown carpenters' glue, bought in

liquid form, is used in making glue stencils and tusche stencils. This is sometimes known as "strength" glue. Water is used to dissolve it and to keep it thin.

● Tusche and Crayon

Lithograph tusche has been used for many years in making stencils. In recent years somewhat more satisfactory products have been developed especially for silk screen work; these are known by the same name or variants of it. They are available from the supply houses.

Ordinary children's wax crayons are used for making crayon stencils. Lithographic crayon can be used for the same purpose. Candle wax can be used, also paraffin wax (but the latter is hard to see on the screen).

● Masking Tape

Paper masking tape, as used by house painters, has many uses. It can be bought at hardware, paint, art and dime stores.

● Drying Racks

Silk screen prints take a certain time to dry. If there is lots of room, they can be spread out on tables and floor. However, usually some form of drying rack is needed. See Figures 13 and 14 for some suggested types. Two wet prints can be hung back-to-back from each clip. For large prints, two rows of clips side by side may be needed, (Figure 13).

● Cleaning Materials

- paper towels
- absorbent rags
- cellulose sponge
- small natural-bristle brush —3" to 6" long —
it must have natural bristles, since plastic
or nylon bristles are likely to damage the
silk. A nail brush or shoe brush is often
suitable.
- newspapers
- solvents
(mineral spirits, varsol, kerosene, and so
on as described on page 5)
- water

● Textile Printing Colours

For printing on textiles we need cans of colour and an extender or base that is formulated especially for the purpose. These are obtained from the silk screen supplier.

Follow the instructions on the can as to solvents, setting the colour, etc. Some kinds must be air dried for three days before washing. Others must be heated in the oven or ironed to make the colour fast. (In this case be careful not to burn the fabric.)

Figure 13

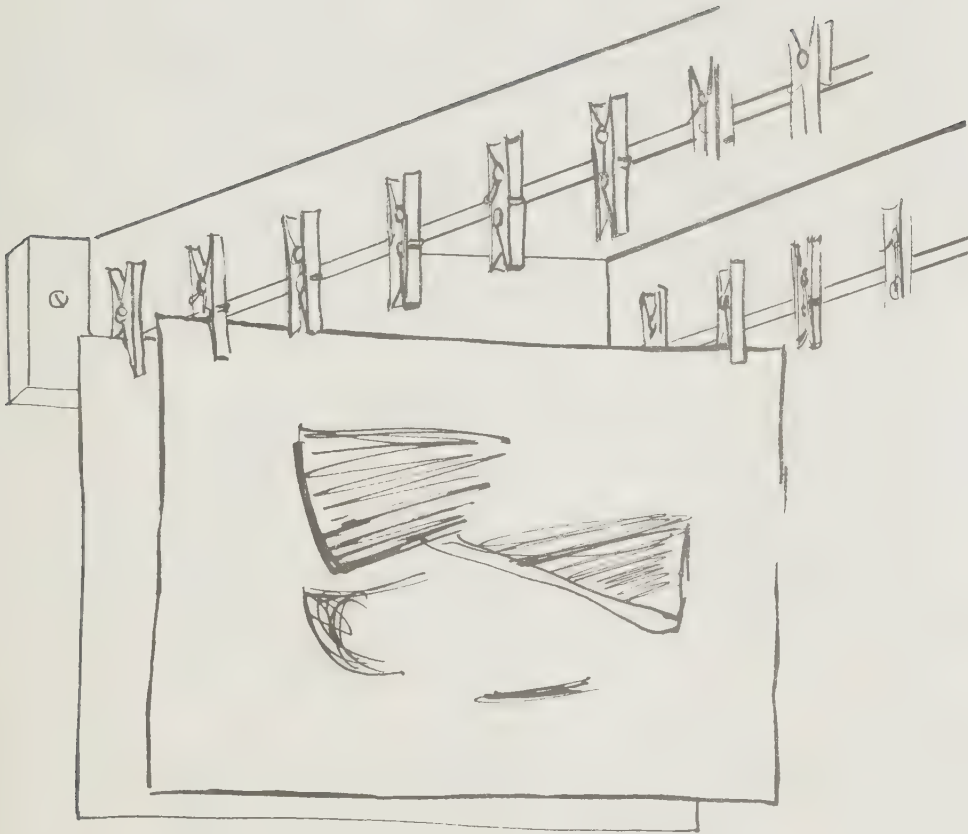
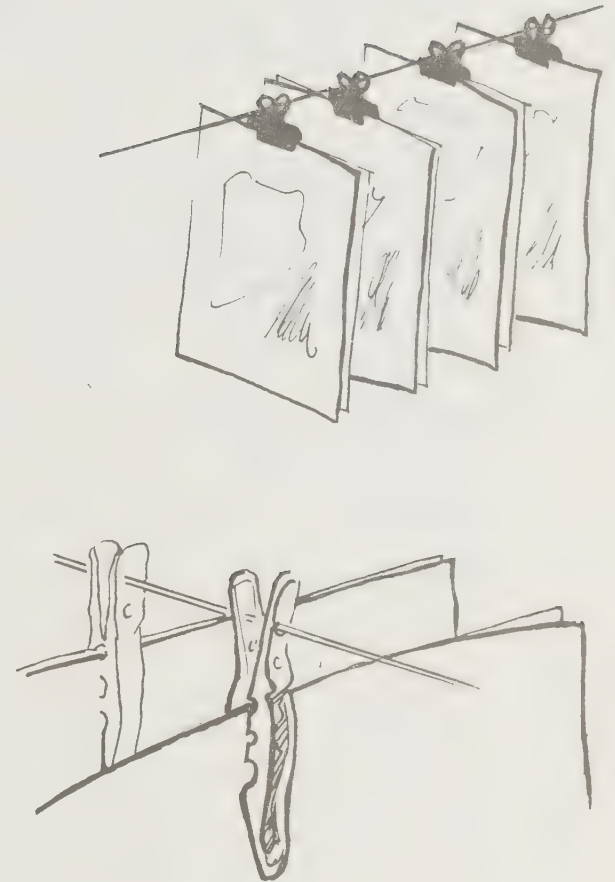


Figure 14



METHOD OF PRINTING — THE PAPER STENCIL

The simplest way to make a stencil on the silk screen is by using paper to block out the areas where colour is not wanted in the print.

Newsprint makes an excellent paper stencil — it can be cut or torn easily but any other thin paper will do. An absorbent paper such as newsprint sticks better to the screen than a hard-surfaced paper. Making a paper stencil and printing with it is the best way to get acquainted with the medium.

● To Make a Paper Stencil and Print

1. Take a piece of newspaper big enough to cover the screen and tear a good-sized piece out of the middle. The hole will be the total area printed. Now cut or tear some shapes—abstract or pictorial—from another piece of paper and arrange them in the hole in the first piece of paper until a satisfactory composition is achieved.

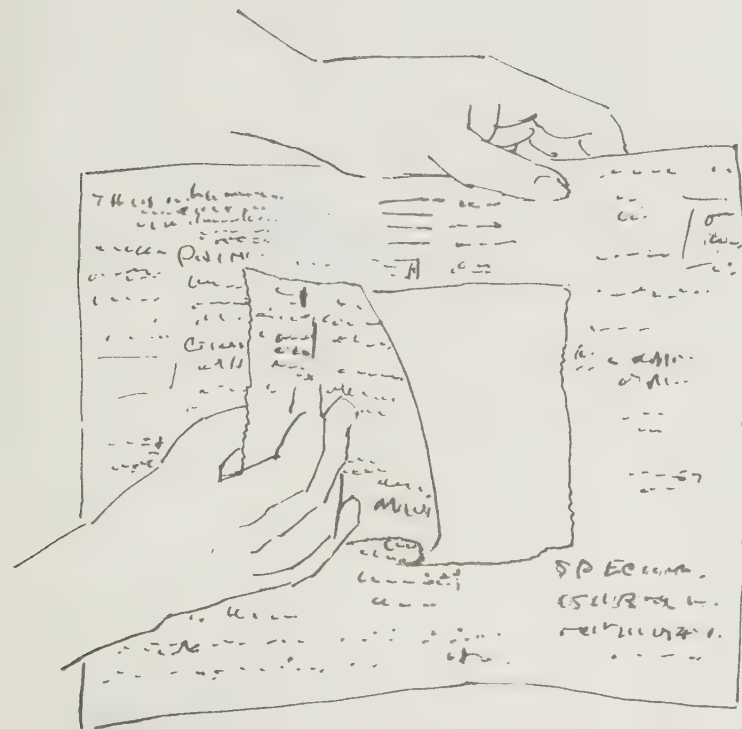
2. Place this composition on another piece of paper on the baseboard of the screen. Be sure all the pieces of paper are flat. Bring the screen down and make sure all the pieces are where you want them in relation to the screen area. All the

pieces will be held to the screen by the ink after the first printing with squeegee and ink. If any pieces near the edge are not secure after that, they can be fastened down with masking tape.

3. Now mix ink of the colour wanted. The quantity depends on the area to be printed and the number of prints. Try $\frac{1}{2}$ cup to start. The best ink to start with is one mixed from transparent base and tube oil colours. The mixture may need thinning with varsol or mineral spirits—the consistency needed depends on many factors and must be learned by experience. Test the colour by smearing some thinly on paper to get an approximate idea of the colour in printing. Most colours look very different in the container. This is still just a rough guide to the colour that will appear on the print; it will depend on the thickness of the ink layer on the paper.

4. When the ink is ready and the stencil in place as described above, pour a quantity of ink in a line along one end of the screen. See Figure 15.

5. Take the squeegee in both hands. (Figure 16). Place it as shown on the screen. Wet the edge of the squeegee in the ink and with a firm steady motion and firm pressure, carry all the ink across the full length of the screen by scraping it along the silk by means of the squeegee.



(a) Tearing stencil out of newspaper

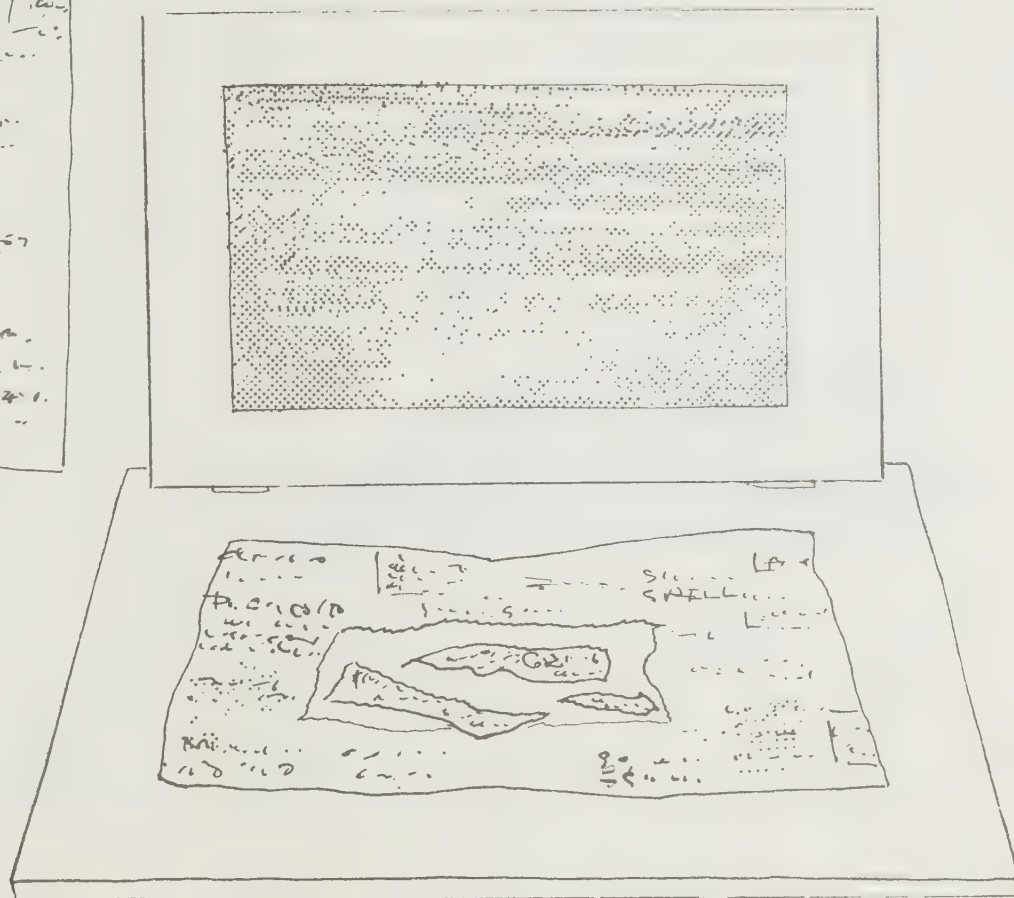
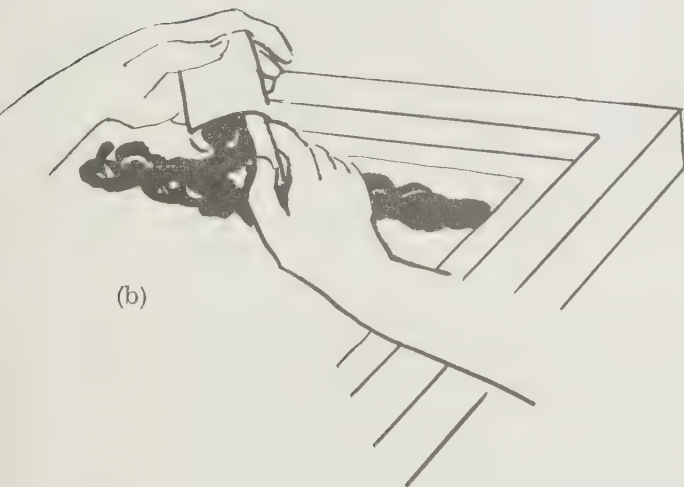


Figure 15

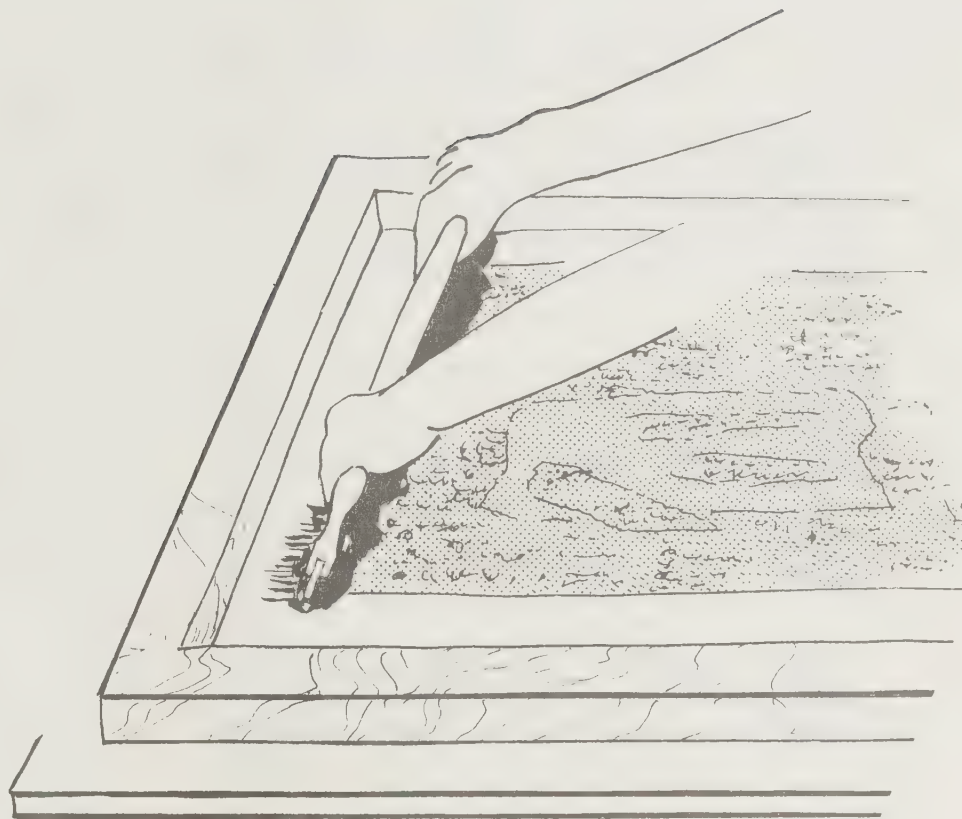


Use of tongue depressor for stirring ink



Pouring ink on screen

Figure 16



Use of squeegee to carry ink

6. Rest the squeegee against the edge and lift the screen at once. Prop it up. If the print has stayed with the screen (it should not), peel it off immediately.

7. All the pieces of the stencil should now be held on to the screen by the ink. Now tape down the edges of the big piece if necessary. If any pieces of the stencil have come away with the print (unlikely, but possible) remove them carefully and put them back on the screen where they belong.

8. Continue printing as soon as possible, (before any ink dries on the screen) by placing another sheet of paper under the screen and sweeping the ink from the end where it and the squeegee now rest, to the other end. Add more ink as necessary. All operations should be done quickly and steadily. The best results are obtained by leaving as short a time as possible between one printing and the next, as the ink will begin to dry and clog the screen.

9. When the required number of prints has been made, pick up as much as possible of the ink left in the screen by using a small piece of stiff cardboard, say 2"x2½", or a tongue depressor. Put it back in the mixing container; it can be re-used or used in mixing a new colour. Then peel the

paper stencil off the screen and proceed as quickly as possible to clean the squeegee and screen as described below.

● Cleaning the Screen and Squeegee

Clean the squeegee first — it is a shorter job. First wipe off as much ink as possible with paper towels. Then clean off the rest using varsol on a rag or paper towel and wipe with a dry rag to remove any solvent. Hardened paint may crack the rubber blade.

Remove as much paint as possible from the screen by using a small piece of stiff cardboard (say about 2"x2½") or a tongue depressor to gather it together (use like a squeegee) and to pick it up and put it back into the mixing container or into a storage container. The more paint removed in this step, the less needs to be removed in the more laborious step of cleaning with solvent.

When the printing has been done with a paper stencil, first peel the paper off the bottom of the screen and remove any tape that may have been used.

Note: With any other kind of stencil, the screen is

cleaned before removing the stencil. The methods of removing each kind of stencil will be described under the various printing methods.

Put several sheets of newspaper under the screen. Pour a small quantity of varsol into the screen; and wash the screen and frame with it using a rag or paper towel. It will go through and be absorbed by the newspaper underneath, carrying much of the paint with it. Raise the screen and look through it toward the light. If there is still a fair amount of paint in the meshes, change the newspaper on the bed and repeat the washing procedure with varsol.

When as much paint as possible has been removed by this method, raise the screen and let stand in its vertical position. Wet a section of the screen with more varsol on a rag or paper towel. Take two clean pieces of rag or towel, one in each hand, and using one hand on each side of the screen press the rags together and move them around, always together, to absorb as much of the varsol as possible. Repeat over the whole screen. When as much paint as possible has been removed in this way, use lacquer thinner (a better, but a more expensive, solvent for the paint) and the same procedure with two rags to clean the last traces of paint from the screen. Be careful not to breathe in too much of the fumes from the lacquer thinners — they can be dangerous.

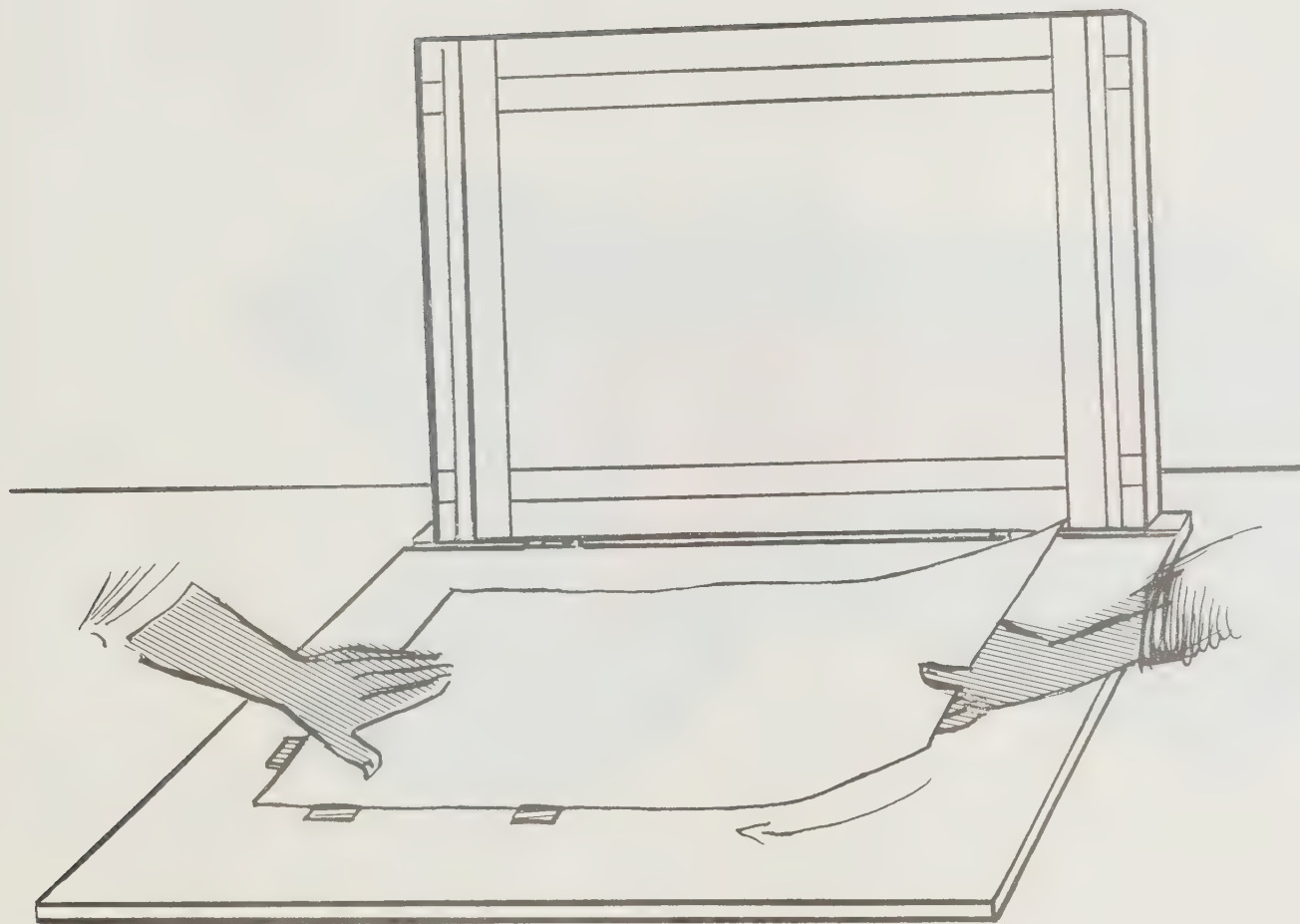
Check the screen by looking through it toward the light — every opening in the mesh must be clear. The silk may show some colour even then, because some paints seem to dye the silk; this is all right, as long as the mesh is open.

MULTICOLOUR PRINTING — REGISTRATION

When the finished work is to have two or more printings of different colours from different stencils, it is necessary to print the second colour in the right place over the first colour every time. This is the problem of registration.

The simplest way to ensure correct registration of colours for prints on paper or cardboard will be described. To fix the position of any rectangular piece of paper it is necessary to know three points—two along one side, and a third on one of the sides at right angles to the first. It can be seen from the diagram (Figure 17) that if the edges touch all three points, the paper can be in one position only. The three register guides can be made from several layers of masking tape carefully placed on the base-board and used to build up enough thickness so that the paper can be pushed against them. To get the right position for the guides, place a piece of

Figure 17



Sliding paper against the register guides



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the printing paper under the screen in the right position; lift the screen, and place the guides at the edges of the paper. The two sides of the paper which touch the guides should be clean-cut. It is very difficult to be accurate with torn or deckle edges.

It is also wise to use register guides for a single colour print, in order to be sure that the print is in the right place on the paper.

● Use of Transparent Inks

When the second colour is printed with transparent ink, the areas where the second colour is printed over the first colour will appear to be a different colour from the areas where the second colour is printed directly on the paper. By this means a print in three colours, plus the colour of the paper, can be produced by two printings. See examples and Figure 18.

● Glue Stop-out

Stencils can be made by painting directly on the silk a substance which will not permit the ink to pass through the meshes. The most commonly used

material for this method is old-fashioned brown water-soluble carpenters' glue. This glue can be bought ready-mixed in cans from hardware stores.

● To Make A Glue Stencil

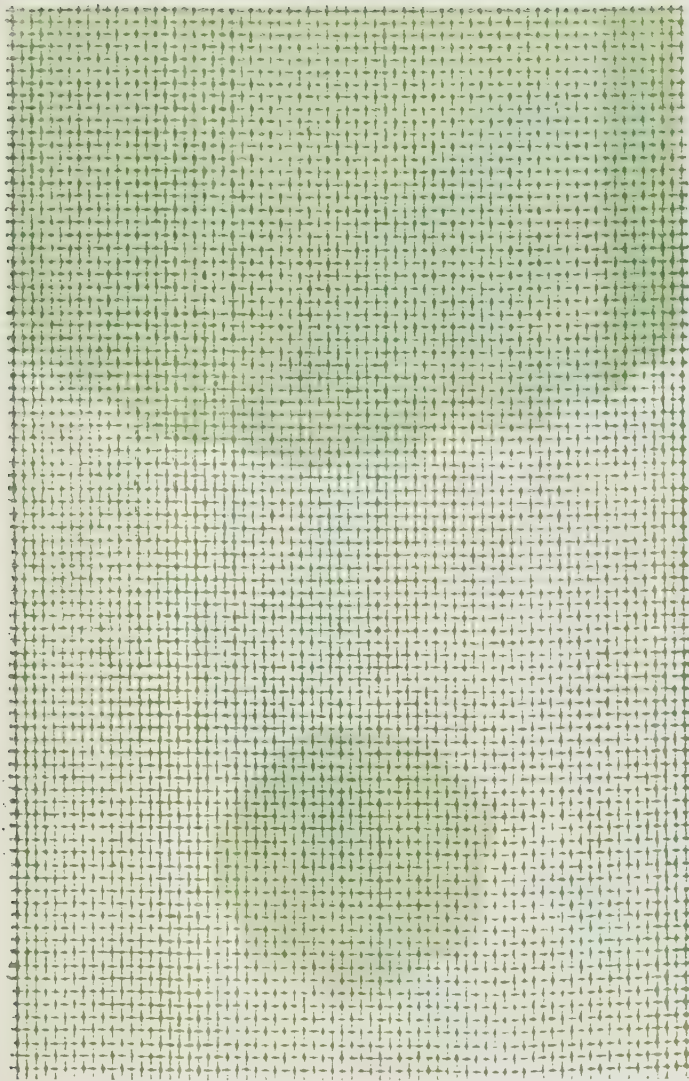
1. Thin the glue to working consistency with water. Use equal quantities of glue and water and mix thoroughly. Add a very little food-colouring or watercolour to make the glue easier to see on the screen.

2. Raise the screen from the baseboard so that the glue will not go through to the baseboard. A pencil under one edge of the screen gives the needed separation without tilting the screen too much.

3. Use a watercolour brush to paint glue in the areas of the screen where the paint is not to pass through to the paper in printing. Use just enough glue to fill the meshes of the screen in these areas. If a sketch has been made while planning the print, it may be placed under the screen. It will be visible through the silk. The sketch may be referred to directly during the gluing-in process, or guidelines may be penciled on the silk before it is raised from the baseboard. If this is a second or subsequent colour, a print from the first stencil



Glue applied by cardboard, sponge, ruling pen, fingers, and eye dropper.



Glue painted on silk



(Stencil) Serigraph print from glue stop-out



Figure 1.5

may be placed under the screen, lined up properly with the register guides, to be used in planning the stencil. Glue can also be applied by spatter, splash, drip, or by sticks, bits of cardboard, fingers, or anything else that you can think of to get particular effects.

4. Raise the screen and look through it toward the light to make sure that all areas which are not to print are filled completely. Any pinholes left open will print. If there are any drops of glue on the bottom of the screen remove them carefully. (They will take too long to dry and may cause problems in printing.) Check again for pinholes in the glue film.

5. Allow the glue to dry completely. Drying may be speeded up by warmth and air circulation - i. e., the use of a fan (or a hair-dryer of the hand-held type).

6. When the glue is dry, proceed with the printing as described before. Pinholes can be patched with masking tape on the bottom of the screen.

7. When the printing is completed, pick up excess paint and clean the screen.

8. To remove the glue stencil, wash out the glue

with water, warm if possible. Put several thicknesses of newspaper on the baseboard, lower the screen, wet the cellulose sponge and rub it over the silk. The glue is dissolved by the water and absorbed by the newspapers beneath. A brush or rag may be used instead, but the sponge is quickest. Some people prefer to unpin the screen and take it to the sink to clean out the glue. The choice of methods is simply a matter of convenience and individual preference.

9. Check the screen against the light to make sure all the glue has been removed. If not, continue washing it until it is clean.

● Variations in Glue Stencil Technique

Water may be used to dissolve and remove parts of a glue stencil. This may be done to make corrections or for textural effects. To remove an area of glue, use a brush to wet the area from the top, allow it to stand until the glue is dissolved, and blot with paper towel from below.

● Progressive Stop-out

Progressive stop-out is a method useful for many



Progressive glue stop-out using the same transparent colour in each printing

designs. After a stencil has been used for printing and the ink been cleaned out of the screen, the stencil can be changed by painting more glue into the open areas. When printing with the new stencil, the second or third colour will be printed over parts of the previous colour. Progressive stop-out can be used with other methods of stencil-making also.

TUSCHE AND CRAYON STENCILS

The use of tusche and crayon permits the greatest variety of any method of stencil-making. Tusche (a liquid) is used to paint, and crayon to draw the lines and areas that will be printed. Contrast this with the previous methods in which the areas not to be printed were filled in (i. e. covered) with glue or paper. Now we paint in the areas which are to be printed.

● To Make a Tusche Stencil

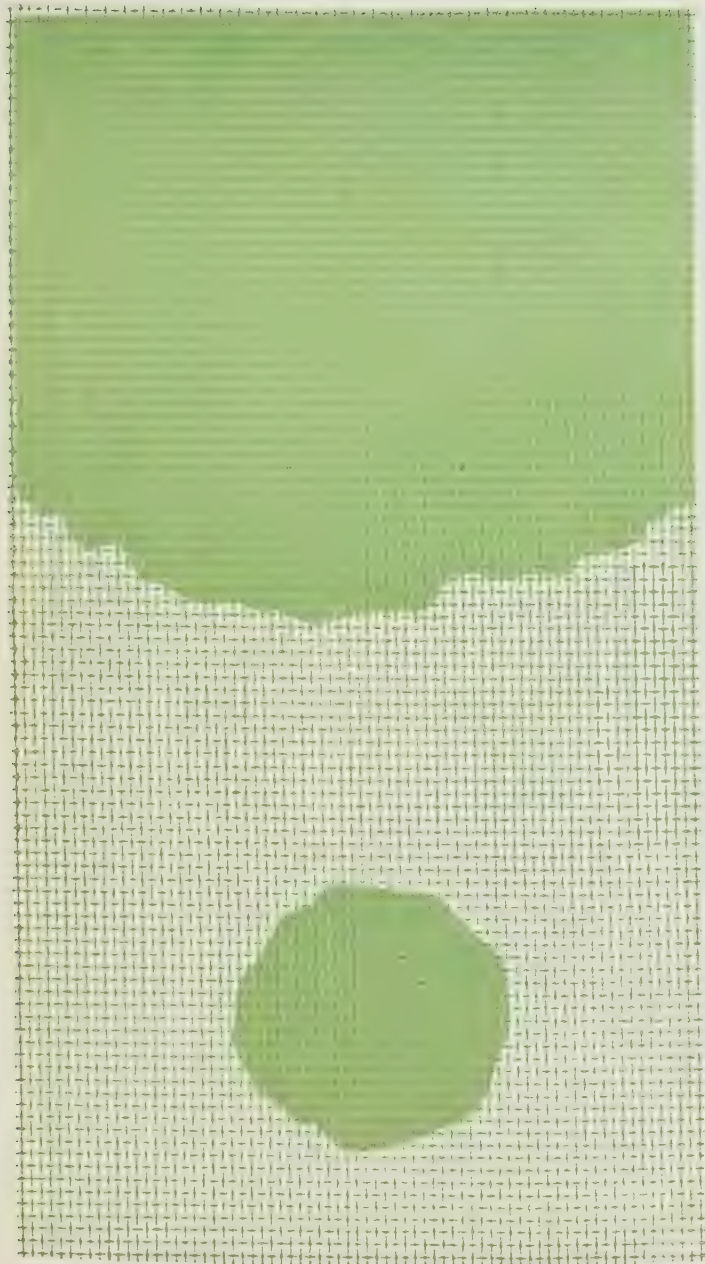
1. Raise the screen slightly from the baseboard by putting a pencil under one edge.
2. Use tusche to paint in the areas which are to be printed. The tusche may be thinned if desired

with the thinner specified on the label — usually water. It can be used for lines, texture, solid areas. It can be applied by various means for special effects — spatter, drip, splash, spray, with a pen, sticks, cardboard, fingers or anything else which will give a special effect wanted in the composition. A sketch or a print of previous colours may be placed under the screen to use in organizing the composition.

3. Allow the tusche to dry completely. Drying may be speeded by fanning.
4. When the screen is dry, the whole screen is covered with glue of the strength used for the glue stencil (50% glue from the can, 50% water, well-mixed). The screen must be raised slightly from the base for this operation also. A little glue is poured into one corner of the screen and a piece of stiff cardboard (say 2" x 2½") is used in the manner of a squeegee to carry it back and forth until the whole screen is covered uniformly. Note the angle of the cardboard relative to the direction of movement as in Figure 19 (b).
5. Let the glue dry thoroughly.
6. Repeat gluing as in (4). Pick up any leftover glue with cardboard and return it to the container.

Use of various textures when applying tusche





Tusche painted on silk



Glue covering tusche and silk

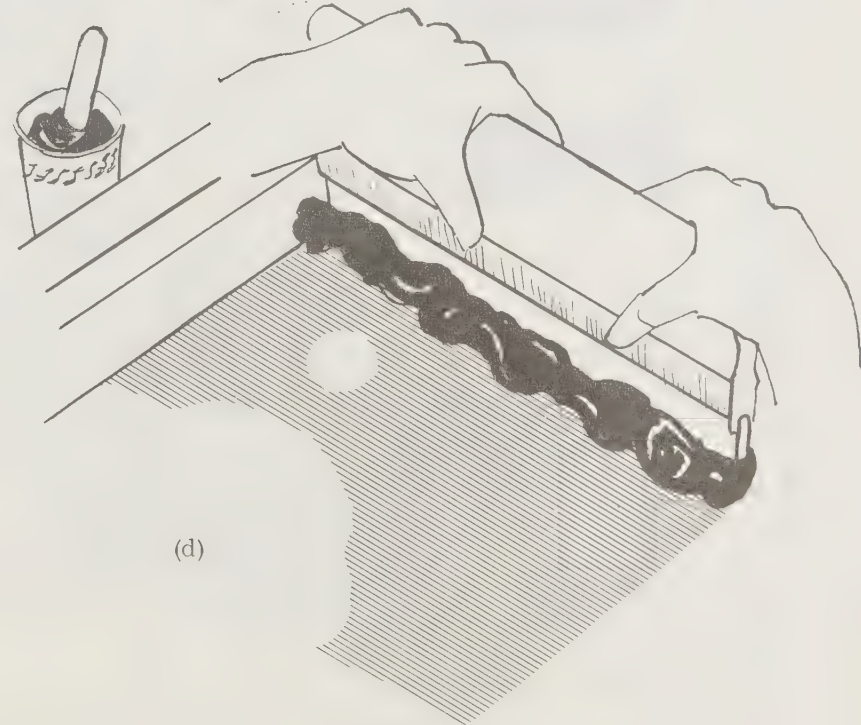
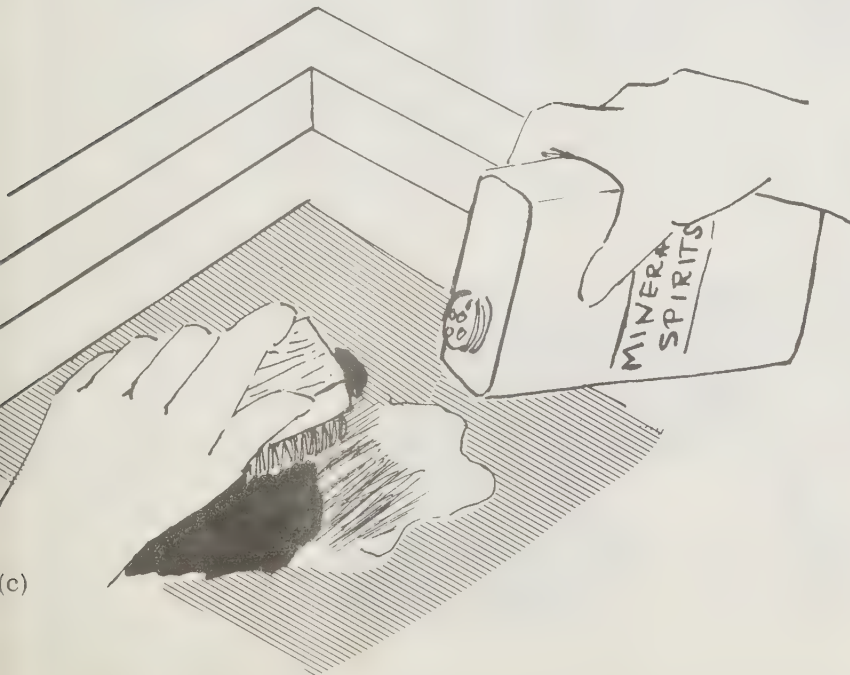
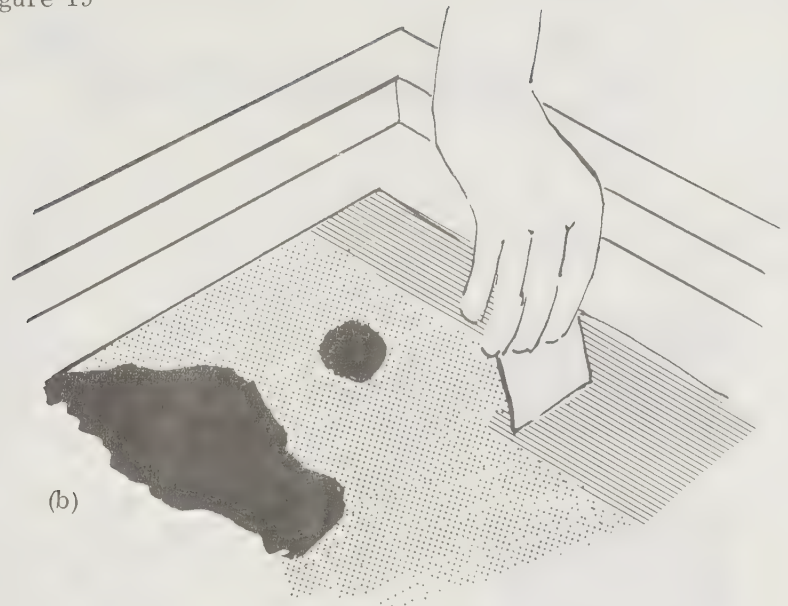
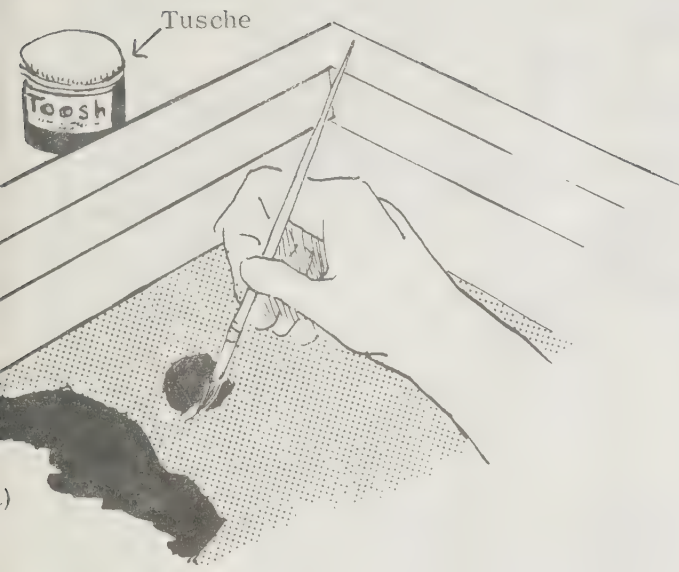


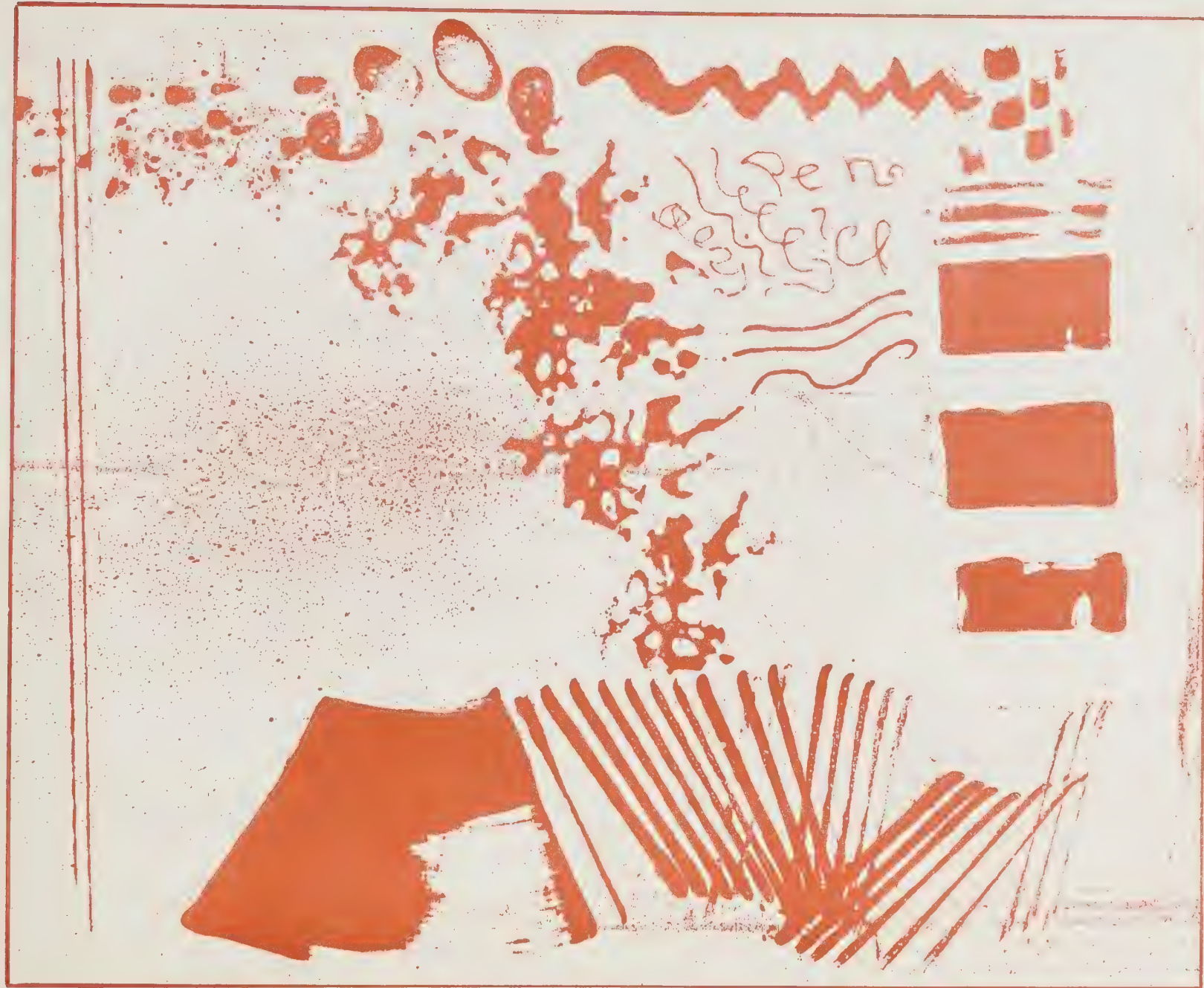
Glue stop-out remaining after tusche is washed out



Tusche and glue stop-out print

Figure 19





Tusche applied with pen, sponge, dropper, fingers, cardboard, and spattered.

7. Hold the screen up and look through it at the light to check for pinholes in the glue. If any are found, patch them with fresh glue or masking tape.

8. When the glue is completely dry, the tusche is removed. The key to this process is that the glue is soluble in water, while the tusche is soluble in varsol. The glue which covers the tusche areas comes away with the tusche when screen is washed with varsol.

Put newspaper under the screen, pour some varsol into the screen, and use a bristle brush to scrub the areas which have been painted with tusche until all the tusche has been dissolved. Be careful not to rip the silk with the corner of the brush; keep it flat on the silk while scrubbing to avoid this. When finished wipe with paper towels on both sides of the screen. Check results by holding the screen up to the light, to make sure that all the areas that are to print have been opened.

9. Print.

10. Clean out the paint using varsol and finishing with lacquer thinners.

11. Remove the stencil in the same way as the direct glue stencil (using water).

● The Crayon Stencil

A lithograph crayon or ordinary wax crayon, even a piece of paraffin wax can be used to draw on the screen. Wax is insoluble in water but soluble in varsol, so the procedure is the same as for a tusche stencil. The crayon can be used to produce a wide variety of textures. A surface with a strong three-dimensional texture can be placed under the silk and the crayon rubbed over the silk to reproduce the texture in a two-dimensional form. It is like taking a rubbing from a coin. Make sure the crayon deposit is heavy enough to fill the mesh and is not just sitting on top of the silk. Check by holding up to the light. Follow steps 4 to 11 in the instructions for the tusche stencil.

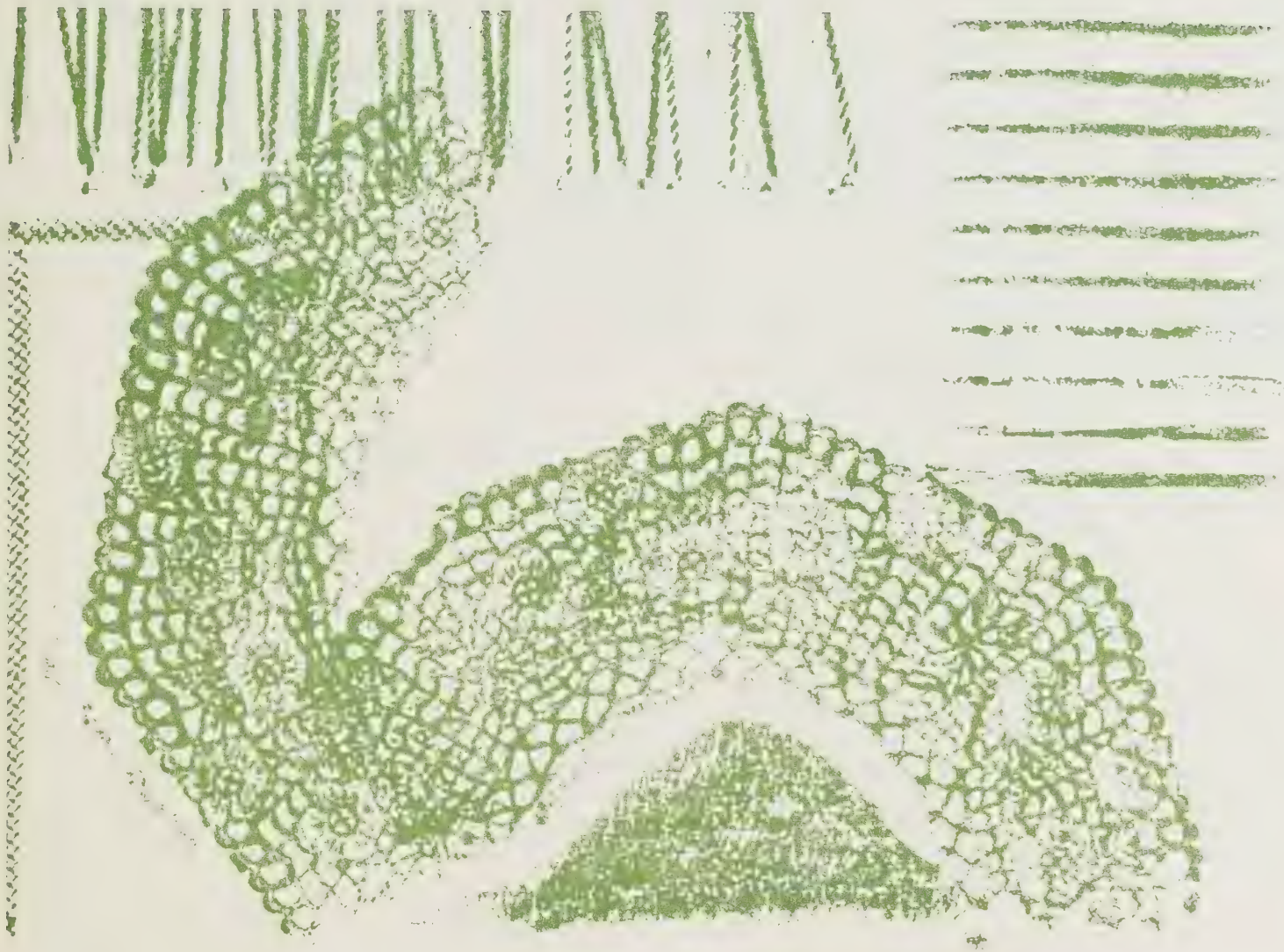
Crayon and tusche can be used in the same stencil.

● The Half-glue Stencil

When making a tusche and/or crayon stencil, the glue used to cover the screen may be further thinned with water (another 50% water added to the glue mixture used for the ordinary glue or tusche stencil, making 25% glue from the can and



Use of Tusche



Crayon Stencil

75% water). A stencil covered with this half-strength glue is full of tiny pinholes after the water has all evaporated. Give the screen only one coat of glue. This will produce a very fine texture when the stencil is printed. This is called a half-glue stencil. Half-glue can be used in some areas and full-glue in other areas of the same stencil. The half-glue stencil is much more fragile than the full-glue stencil and gives fewer prints before breaking down and losing its subtlety.

PROFILM

Profilm (or nufilm, blufilm) was developed for the commercial uses of the silk screen process. It is used especially for poster work to give sharp, clear edges. It is of less interest to the artist-craftsman, but it can be used to produce effects which are characteristic of the material. It consists of a lacquer film on a sheet of backing paper, the whole transparent enough to show a drawing underneath it. The film and its adhering liquid and solvent can be bought from the silk screen process suppliers. Be sure to get the solvents recommended for the particular film you buy.

● To Make a Profilm Stencil

1. Cut a piece of film big enough to cover the area of the stencil and put it over the drawing. Use tape to fasten it in place. (Be sure it is film side up, backing side down.) See Figure 20.

2. Take a very sharp-pointed knife (X-acto type knife) and cut around the outlines of the areas which are to print on the stencil. Cut through the film but not the backing! Cross the cuts at the corners so that the film will come away cleanly.

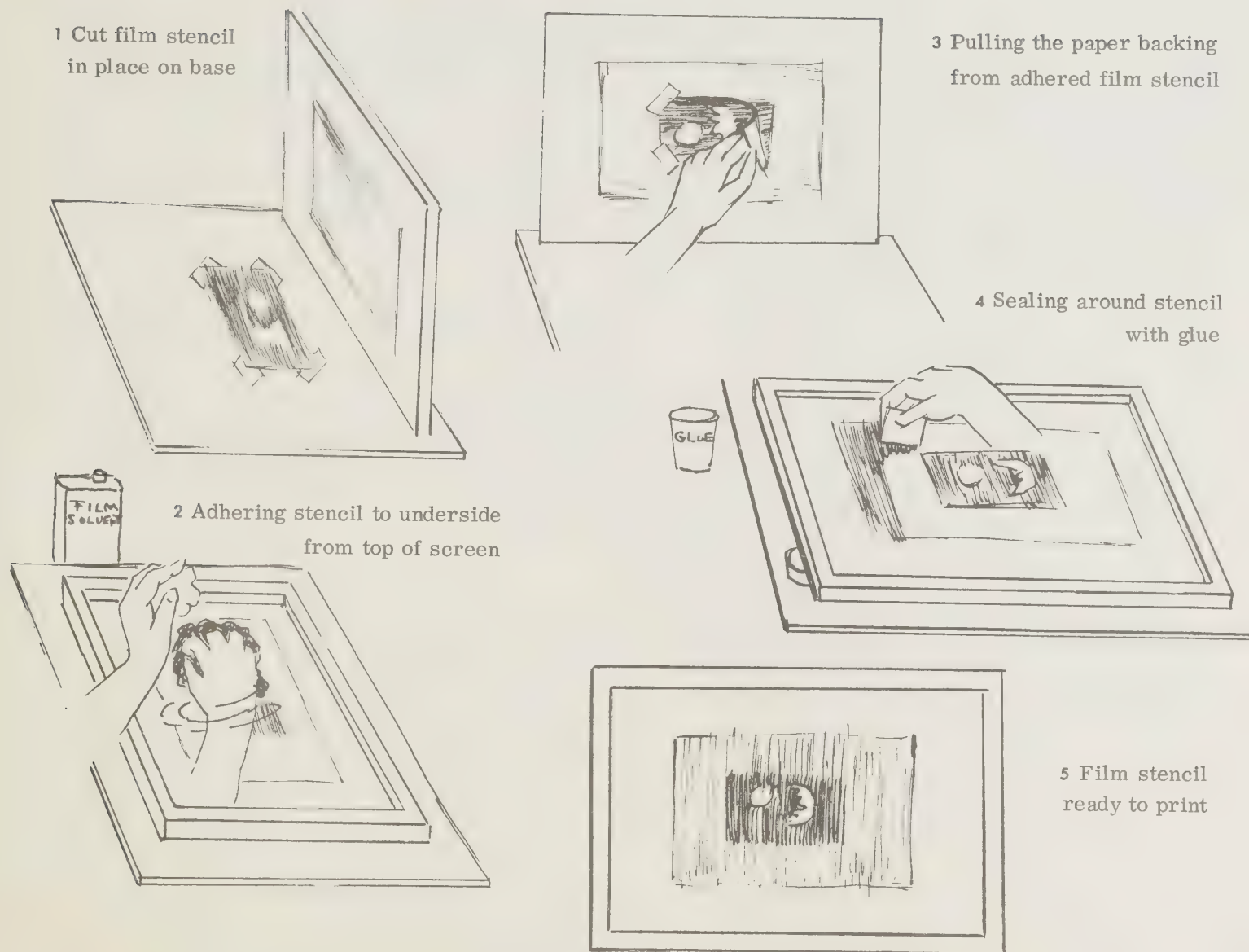
3. Strip off the areas of film where paint is to pass through the finished stencil. The backing sheet will hold all the parts of the stencil in the right place.

4. Adhere the stencil to the screen. Place the stencil under the screen with the film side up. Take a pad of soft cloth and pour some adhering liquid on it. Wet a small area of the screen with it; then immediately rub the entire area vigorously with a pad of dry cloth. When done properly this will adhere the film quite firmly to the silk. In any case do not use too much of the adhering liquid or you may find you have dissolved part of the stencil. Repeat over the whole area of the stencil before lifting the screen.



Profilm stencil using knife and burning tool

Figure 20



5. Raise the screen and allow the film to dry thoroughly — five minutes or more.
6. Strip off the backing sheet.
7. Stop out the surrounding area if necessary. This can be done with paper, glue or lacquer.
8. Print.
9. Clean out the paint (using varsol and lacquer thinners).
- 10.. Remove the film stencil with the recommended solvent (or removing thinner). The method is the same as before — newspapers underneath to absorb solvent and dissolved stencil, finish with a rag in each hand on either side of the screen.

● Use of the Burning Tool

Very interesting effects can be produced by using a burning tool on the film. The electric burning tool can be bought at art or craft stores. (They are made for burning decorations into wood.) When the heated tip is touched to the film, it melts the film. It can be used for lines, dots and textures.

● Texture

Brush some lacquer thinner or film solvent over an area of the film. While the film is tacky, press a piece of sandpaper against it and take it away instantly. It will bring away parts of the film with it. Other rough-textured materials can be used in this way. The film is then adhered as usual. The method is difficult to control.

PHOTOGRAPHIC STENCILS

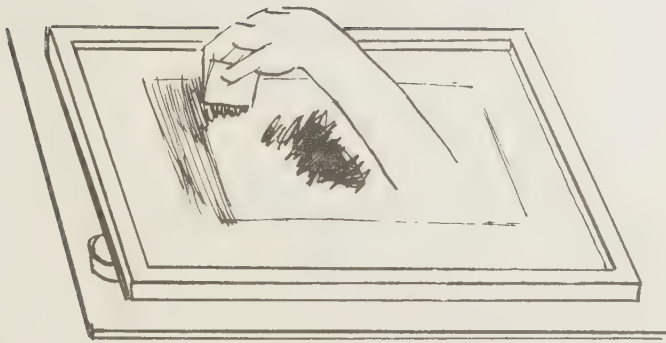
Photographic stencils are in common use in commercial work. They are of less interest to the artist in silk screen work, because they merely reproduce work (e. g. an ink drawing) which has been carried out in another medium. Nonetheless, they have been used with artistic purpose and excellent effect by some of the recent Pop artists. Since the methods are different for the materials supplied by different manufacturers, none of them will be given here. The suppliers and instructions are available from the silk screen process suppliers.



Profilm with burning tool

MONOPRINTS

The silk screen, like other printing media, can be used to produce monoprints. A monoprint is a single print made by using a printing medium and materials. In silk screenwork this means using a clear screen with no stencil on it, and manipulating the colours by any methods which will give the desired results. Colours can be squeegeed through the screen in small areas by the use of small cards, or paint can be dripped or brushed on to different areas and then squeegeed through with the regular squeegee, either clean or carrying another colour with it. Paint can be placed in areas of the screen where wanted and driven through the screen not by the squeegee but by raising the screen slightly and banging it down on the paper firmly; this gives a thick layer of ink with a special texture. Any of these methods can be used in conjunction with one or more stencils made by any of the previous methods. A little experimentation will show the wide possibilities of the monoprint.



NOTES

EXPERIMENTS FOR BEGINNERS

1. Paper Stencil— area plus 3 to 5 spot design— one colour plus paper
2. Paper Stencil— 2 colour print— use of transparency to give 3 colour effect — no paper showing within design area
3. Glue Stop-out — 2 or more colours
4. Tusche and/or Crayon — can be combined with other techniques for multicolour work
5. Monoprints — experimentation
6. Profilm — cut or burn — in combination

Working through experiments 1 to 4 will give a beginner who knows nothing about silk screen printing enough knowledge and technique to continue on his own.

Experiments 2 and 3 or 3 and 4 can be combined if time is short, although many students find it difficult to grasp so many new concepts at one time.

MATERIALS FOR MAKING A SCREEN

- 2 x 2 pine or other suitable wood
- nails
- white glue
- corner plates (4) and screws
- loose pin butt hinges (2) and screws
- 3/4" plywood (good one side) for baseboard
- sandpaper
- silk
- staple gun or tacks
- 2" wide brown kraft paper gummed tape
- orange shellac

LIST OF BASIC WORKSHOP EQUIPMENT

● For Printing

- screens
- squeegees
- inks - process colours
 - transparent base (economy base extender)
 - artists' tube oil colours
- paper

● For Mixing Ink

- empty tin cans, jars, or paper cups (not plastic),

- stirring sticks (e. g. tongue depressors)

● For Making Stencils

- glue (liquid brown "strength" glue)
- food colour or watercolour for tinting glue
- tusche
- wax crayons
- brushes - good watercolour and/or oil brushes
- cardboard - small pieces
- masking tape

● For Cleaning Up

- water
- varsol or mineral spirits
- lacquer thinner(s)
- newspaper
- paper towels - lots
- rags (absorbent)
- cellulose sponge
- soft natural bristle brush (not nylon or plastic bristles)

